

Properties

ADDITION PROPERTIES

Variable

Numerical

Commutative Property of Addition:

$$a + b = b + a$$

Associative Property of Addition:

$$(a + b) + c = a + (b + c)$$

Identity Property of Addition:

$$a + 0 = a$$

Inverse Property of Addition:

$$a + (-a) = 0$$

MULTIPLICATION PROPERTIES

Commutative Property of Multiplication:

$$ab = ba$$

Associative Property of Multiplication:

$$(ab)c = a(bc)$$

Identity Property of Multiplication:

$$a(1) = a$$

Inverse Property of Multiplication:

$$a\left(\frac{1}{a}\right) = 1$$

Zero Product Property of Multiplication:

$$a(0) = 0$$

Negative One Property for Multiplication:

$$a(-1) = -a$$

Distributive Property of Multiplication:

$$a(b + c) = ab + ac$$

"over addition, over subtraction"

Addition Property of Equality

add same number to each side

Multiplication Property of Equality

multiply same number to each side

Reflexive Property: think reflection

$$a=a$$

Symmetric Property: think balance

$$\text{If } a=b \text{ then } b=a.$$

Transitive Property: think transition

$$\text{if } a = b \text{ and } b = c \text{ then } a = c.$$

Substitution: think substitute

$$\text{if } a=b \text{ then } a \text{ may replace } b$$

Closure: think same type of number

a set of numbers is closed for an operation if all the results for the given operation are also members of the same set of numbers
